

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1 (currently amended) A fuel cell system, comprising;

- a) a fuel cell having a power output for driving a load;
- b) at least one fuel cell peripheral;
- c) a measurement means for determining at least one fuel cell

operation characteristic indicative of the power output of the fuel cell and having a fuel cell operation characteristic spectrum;

d) at least one controller for controlling the operation of the at least one fuel cell peripheral based on the at least one fuel cell operation characteristic; and

wherein said at least one fuel cell peripheral comprises at least one of a coolant recirculation pump, a hydrogen recirculation pump, and a hydrogen purging means;

wherein each fuel cell operation characteristic spectrum is divided into at least two ranges indicative of at least two corresponding ranges of power output, and the controller is adapted to control said at least one fuel cell peripheral to provide a respective, different and constant operational characteristic for said at least one fuel cell peripheral for each range.

Claim 2 (currently amended) A fuel cell system as claimed in claim 1, wherein the fuel cell operation characteristic is selected from the group consisting of current, current density and actual power output.

Claim 3 (cancelled)

Claim 4 (previously presented) A fuel cell system as claimed in claim 2, wherein the controller comprises:

a memory for storing a plurality of ranges in each fuel cell operation characteristic spectrum, and, for each fuel cell peripheral of said at least one fuel cell peripheral, a plurality of operational characteristics correlated with the plurality of ranges; and

a processor for determining a current operating range in the plurality of ranges in the at least one fuel cell operation characteristic spectrum based on the at least one fuel cell operation characteristic measured by the measurement means, and for determining a current operational characteristic correlated with said current operating range;

the controller being operable to operate each fuel cell peripheral at an operational characteristic correlated with said current operating range.

Claim 5 (original) A fuel cell system as claimed in claim 4, wherein the plurality of operational characteristics of the at least one fuel cell operation characteristic includes an idle level in which the load does not draw current from the fuel cell.

Claim 6 (currently amended) A method of operating a fuel cell system comprising a fuel cell, and at least one fuel cell peripheral, comprising

a) providing at least one of a coolant recirculation pump, a hydrogen recirculation pump and a hydrogen purging means as the at least one fuel cell peripheral; b) connecting a load to the fuel cell system and providing a drive current from the fuel cell system to drive the load;

c) measuring at least one fuel cell operation characteristic having at least two ranges; and

d) controlling an operational characteristic of the at least one fuel cell peripheral based on the at least one fuel cell characteristic, and for the at least two different ranges of the fuel cell operation characteristic, providing a respective different and constant operational characteristic for said at least one fuel cell peripheral.

Claim 7 (currently amended) A method as defined in claim 6 wherein the fuel cell operation characteristic is selected from the group consisting of current, current density and ~~actual~~ power output.

Claim 8 (cancelled)

Claim 9 (currently amended) A method as claimed in claim 7, wherein

the at least one fuel cell operation characteristic is variable within a plurality of ranges in a fuel cell operation characteristic spectrum,

step ~~bc)~~ further comprises determining a current operating range of the fuel cell system,

the at least one fuel cell peripheral is operable at a plurality of operational characteristics correlated with the plurality of ranges, and

step ~~ed)~~ further comprises operating the at least one fuel cell peripheral at an operational characteristic correlated with the current operating range of the fuel cell system.

Claim 10 (currently amended) A fuel cell system as claimed in claim 1, wherein the fuel cell operation characteristic spectrum has a plurality of levels, and the levels of the fuel cell operation characteristic spectrum includes a plurality of ranges, with one range being an idle level in which the load does not draw current from the fuel cell.

Claim 11 (currently amended) A fuel cell system, comprising;

a) a fuel cell having a power output for driving a load;

b) at least one fuel cell peripheral;

c) a measurement means for determining at least one fuel cell operation characteristic, indicative of the power output of the fuel cell and having a fuel cell operation characteristic spectrum; and

d) at least one controller for controlling the operation of the at least one fuel cell peripheral based on the at least one fuel cell operation characteristic wherein said at least one fuel cell peripheral is capable of being run at a constant operational characteristic;

wherein each fuel cell operation characteristic spectrum is divided into at least two ranges, and the controller is adapted to control said at least one fuel cell peripheral to provide a respective, ~~and different~~ and constant operational characteristic for said at least one fuel cell peripheral for each range.

Claim 12 (previously presented) A fuel cell system as claimed in claim 11, wherein the fuel cell operation characteristic is selected from the group consisting of current, current density and actual power output.

Claim 13 (previously presented) A fuel cell system as claimed in claim 12, wherein the controller comprises:

a memory for storing a plurality of ranges in each fuel cell operation characteristic spectrum, and, for each fuel cell peripheral of said at least one fuel cell peripheral, a plurality of operational characteristics correlated with the plurality of ranges; and

a processor for determining a current operating range in the plurality of ranges in the at least one fuel cell operation characteristic spectrum based on the at least one fuel cell operation characteristic measured by the measurement means, and for determining a current operational characteristic correlated with said current operating range;

the controller being operable to operate each fuel cell peripheral at an operational characteristic correlated with said current range.

Claim 14 (previously presented) A fuel cell system as claimed in claim 13, wherein the plurality of operational characteristics of the at least one fuel cell operation characteristic includes an idle level in which the load does not draw current from the fuel cell.

Claim 15 (currently amended) A method of operating a fuel cell system comprising a fuel cell, and at least one fuel cell peripheral capable of being run at a constant operational characteristic, the method, comprising

a) connecting a load to the fuel cell system and providing a drive current from the fuel cell system to drive the load;

b) measuring at least one fuel cell operation characteristic having at least two ranges; and

c) controlling an operational characteristic of the at least one fuel cell peripheral based on the at least one fuel cell characteristic, and for each range of the fuel cell operation characteristic, providing a respective, different and constant operational characteristic for said at least one fuel cell peripheral.

Claim 16 (currently amended) A method as claimed in claim 15, wherein

the at least one fuel cell operation characteristic is variable within a plurality of ranges in a fuel cell operation characteristic spectrum,

step (b) further comprises determining a current operating range of the fuel cell system,

the at least one fuel cell peripheral is operable at a plurality of operational characteristics correlated with the plurality of ranges, and

step (c) further comprises operating the at least one fuel cell peripheral at an operational characteristic correlated with the current operating range of the fuel cell system.

Claim 17 (currently amended) A fuel cell system comprising:

(a) a fuel cell for driving a load;
(b) at least one fuel cell peripheral;
(c) a measurement means for determining at least one fuel cell operation characteristic indicative of a power output of the fuel cell and having a fuel cell operation characteristic spectrum; and

(d) at least one controller for controlling the operation of at least one fuel cell peripheral based on the at least one fuel cell operation characteristic;

wherein each fuel cell operation characteristic spectrum is divided into at least two ranges indicative of at least two corresponding ranges of power output, and the controller is adapted to control said at least one fuel cell peripheral to provide a respective different and constant operation characteristic for said at least one fuel cell peripheral for each range;

wherein the fuel cell includes a fuel inlet, a fuel outlet, an oxidant inlet and an oxidant outlet, a fuel supply line connected to the fuel inlet and an oxidant supply line connected to the oxidant inlet, and a recirculation line connected to the oxidant outlet and extending through at least one of a humidifier located in the fuel supply line for humidifying the incoming fuel and another humidifier located in the oxidant supply line for humidifying the incoming oxidant.

Claim 18 (previously presented) A fuel cell system as claimed in claim 17, including a cooling circuit extending through the fuel cell and including a pump for pumping coolant through the cooling circuit and a heat exchanger for discharging heat from the cooling circuit, wherein the pump comprises one of the at least one fuel cell peripheral.

Claim 19 (previously presented) A fuel cell system as claimed in claim 18, including a second cooling circuit, wherein the heat exchanger of the first cooling circuit is located in the second cooling circuit for transferring heat to the second cooling circuit, and wherein the second cooling circuit includes a respective second pump and a second heat exchanger for discharging heat from the second cooling circuit, the second pump further comprising one of the at least one fuel cell peripheral.

Claim 20 (previously presented) A fuel cell system as claimed in claim 18, wherein a fuel cell operates at a pressure in excess of atmospheric pressure and a compressor is provided for compressing incoming air, as an oxidant, for supply to the oxidant inlet of the fuel cell; and

wherein the first coolant loop additionally includes at least one of a heat exchanger for cooling the compressor and a heat exchanger in the oxidant supply line downstream from the compressor for cooling compressed air.